ECE 416
25th January 2018
Outline

• ECE 416 Schedule

• Comments on SDP Report
  • Style
  • Figures and Tables
  • References
  • Equations
  • Table 1 (Specifications)

• Volunteer Teams for Open House Demos
Hi everyone: We need to get everyone into the correct lab section of ECE 416 as soon as possible, so please check and SWAP your section for the right one right away, according to your SDP team advisor as shown in the list below.

Thank you.

If you have any questions, please let me know.

// wjl

01MR     Aksamija, Zlatan
01LN     Anderson, Neal
01NM     Burleson, Wayne
01MV     Ciesielski, Maciej
01LR     Duarte, Marco
01MN     Eslami, Y.
01LL     Gao, Lixin
Benchside Meetings

- Block Diagram
- CDR deliverables
- Benchside Demo
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- Block Diagram
- CDR deliverables
- Benchside Demo
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Style

- Use correct person
- Use the active voice
- Put statements in positive form
- Use definite, specific concrete language
- Omit needless words
The Elements of Style

Fourth Edition

Foreword by Roger Angell

...still a little book, small enough and important enough to carry in your pocket, as I carry mine.

— Charles Osgood
Use Correct Person/pronouns

<table>
<thead>
<tr>
<th></th>
<th>Singular</th>
<th>Plural</th>
<th>Possessive</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1st Person</strong></td>
<td>I</td>
<td>we</td>
<td>mine/ours</td>
</tr>
<tr>
<td><strong>2nd Person</strong></td>
<td>you</td>
<td>you</td>
<td>yours</td>
</tr>
<tr>
<td><strong>3rd Person</strong></td>
<td>he/she/it</td>
<td>they</td>
<td>his/hers/its/their</td>
</tr>
</tbody>
</table>
Use Active Voice

The active voice is usually more direct and vigorous than the passive.

*I shall always remember my first visit to Boston.*

This is much better than

*My first visit to Boston will always be remembered by me.*
The habitual use of the active voice makes for **forcible writing**. This is true not only in the narrative concerned principally with action but in **writing of any kind**.
There were a great number of dead leaves lying on the ground.

The reason he left college was that his health became impaired.

It was not long before she was very sorry that she had said what she had.

Dead leaves covered the ground.

Failing health compelled him to leave college.

She soon repented her words.

When a sentence is made stronger, it usually becomes shorter. Brevity is a by-product of vigor.
Put statements in positive form

Make definitive assertions. Avoid tame, colorless, hesitant, noncommittal language

He was not very often on time. He usually came late.

They did not think that studying electronics was a sensible way to use one’s time. They thought the study of electronics a waste of time.
Use definite, specific concrete language

Prefer the specific to the general, the definite to the vague, the concrete to the abstract.

A period of unfavorable weather set it. It was frigid every day for a week.

They showed satisfaction as they took possession of their well-earned reward. They grinned as they pocketed first place in SDP18’s faculty vote.
Vigorous writing is concise. A sentence should contain no unnecessary words, a paragraph no unnecessary sentences, for the same reason that a drawing should have no unnecessary lines and a computer program no unnecessary code.
Vigorous writing is concise.

the question as to whether
there is no doubt that
used for fuel purposes
she is a woman who
this it a course that
the reason why is that
whether
no doubt
used for fuel
she
this course
because
Writing Style

- Use correct person
- Use the active voice
- Put statements in positive form
- Use definite, specific concrete language
- Omit needless words
Practice in composing emails!
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Figures and Tables

- Figures and tables are integral to a report.
- Introduce and discuss all figures and tables in the text.

“In Figure 1, we show the magnetization curve for the solenoid coil. It shows that saturation occurs for an applied field above 5 A/m.”

- All figures and tables are numbered and have captions.
References

• Substantiate claims; e.g., those made in introduction.

• Reference alternative solutions/designs.

• Reference data sheets and technical specifications.

“We achieve wireless connectivity between the bot and smartphone using the Adafruit Bluefruit LE Shield [4].”

• Empathize with future SDP teams, as they use SDP reports.

Consider Newton's laws for rotational motion

\[ T = J \alpha \]  \hspace{1cm} (1)

where \( T \) is torque, \( J \) is moment of inertia and \( \alpha \) is angular acceleration. In (1) ...
Preparation of Senior Design Project Report

First Author, EE and Second Author, CSE, Third Author, EE, and Fourth Author, CSE

Abstract—This is an editable template. You should follow the format of this template in writing your SDES report. Your abstract must be one paragraph.

I. INTRODUCTION

Start with the statement of the problem. What is the problem you are trying to solve? How big is the problem? Include citations that demonstrate that your problem is significant.

Put your problem in context. How have people solved your problem in the past? Has the problem changed with time? What are the impacts on societal impacts of your problem? How does your problem affect individuals?

Summarize the requirements analysis that you performed. How big was your solution? How much power can it use? How will you measure your solution? List the specifications in a Table as shown in Table 1.

II. DESIGN

A. Overview

How will you solve this problem? What technology will you use? Why do you expect that this technology will solve your problem? What other technologies did you consider? Why didn’t you choose those alternatives.

Include a block diagram as a figure. Describe each block in the diagram. What specifications will each block meet? How do these specifications collectively guarantee that the system will meet the overall specifications?

B. Block 1

Describe what this technical block will do. Explain what technology you will use to build this block. Detail which techniques from courses you will use to build this block. List what you need to learn in order to build this block. Explain an experiment you will perform to design or test this block. Explain how you will analyze the results of this test.

C. Block 2

Describe what this technical block will do. Explain what technology you will use to build this block. Detail which techniques from courses you will use to build this block. List what you need to learn in order to build this block. Explain an experiment you will perform to design or test this block. Explain how you will analyze the results of this test.

D. Block 3

Describe what this technical block will do. Explain what technology you will use to build this block. Detail which techniques from courses you will use to build this block. List what you need to learn in order to build this block. Explain an experiment you will perform to design or test this block. Explain how you will analyze the results of this test.

E. Block 4

Describe what this technical block will do. Explain what technology you will use to build this block. Detail which techniques from courses you will use to build this block. List what you need to learn in order to build this block. Explain an experiment you will perform to design or test this block.

F. A. Author from Lehigh. (e-mail: author1@lehigh.edu)

F. B. Author, Jr., from Auburn. (e-mail: author2@auburn.edu)

F. C. Author from Quincy. (e-mail: author3@quincy.edu)
Design Process: Set Intermediate Goals

- Assess needs
- Analyze requirements
- Design system

Problem Statement
System Specifications
Block Diagram

Detailed block level design and test
Functioning subsystems
System integration and test
### Table 1 (List of requirements and Specifications)

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Provide real-time feedback</td>
<td>Feedback given in less than 100ms</td>
</tr>
<tr>
<td>Provide accurate metric measurements</td>
<td>Within 10% error of Qualisys Oqus Motion Capture System measurements (in UMass Human Motion Lab)</td>
</tr>
<tr>
<td>Lightweight product</td>
<td>Sensor systems (sensors, PCB, and power supply) less than 1 pound</td>
</tr>
<tr>
<td></td>
<td>Waist Clip (Raspberry Pi and power supply) less than 1 pound</td>
</tr>
<tr>
<td>Sufficient battery life</td>
<td>Battery life greater than 2 hours</td>
</tr>
<tr>
<td>User friendly mechanical design</td>
<td>User should be able to put on product easily with little to no added effort</td>
</tr>
</tbody>
</table>

Table 1: List of system requirements and specifications.

Courtesy of Team “Stride,” J. Higgins, J. Menzie, J. Penney and R. Hartnett
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- Volunteer Teams for Open House Demos, 11am-1pm, Sunday, 11th Feb’18